KANSAS COOPERATIVE PLANT DISEASE SURVEY REPORT

PRELIMINARY 2005 KANSAS WHEAT DISEASE LOSS ESTIMATES

JULY 21, 2005

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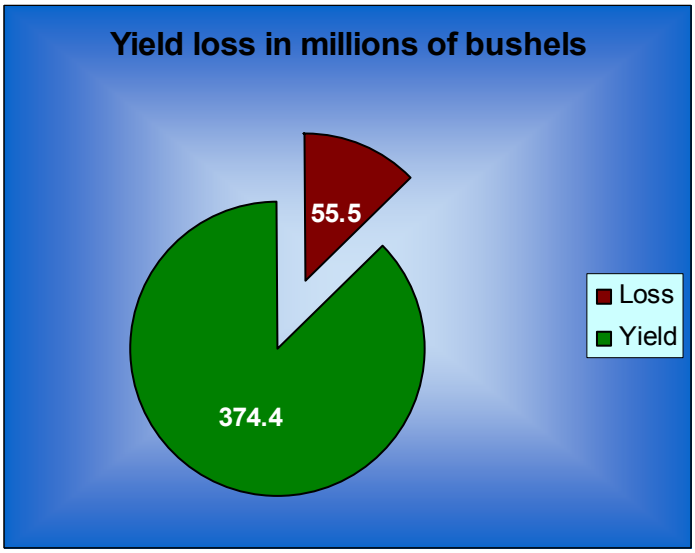
HIGHLIGHTS The loss from diseases to the Kansas wheat crop in 2005 was estimated at 12.9 per cent or about one eighth of the crop.

Figure 1. Yield loss in 2005



This estimate is slightly above the 20 year average of 12.1 per cent.

The KANSAS AGRICULTURAL STATISTICS SERVICE July 12 estimate of 374.4 million bushels represented a harvest of 39 bushels on 9.6 million acres. There was a substantial increase in acres harvested in northwest and west central Kansas as compared to the droughty 2004 harvest.

The 2005 wheat crop was affected by several diseases. First and foremost of importance was stripe rust which was noted in early April and by mid May had covered much of the state in a blanket of yellow rust. Estimate for stripe rust was set at 8.0 per cent or a loss of over 34 million bushels. Two other diseases of significant importance were leaf rust and wheat streak mosaic whose estimates were both set at 2.0%.

DISEASES

Stripe rust was the most important disease to production in Kansas in the 2005 wheat crop. The disease was first noted in early April in southwest Kansas near Cimarron and over the next few weeks was reported in several southwest, west central, south central, and southeastern counties. The source of the disease inoculum was believed to have been from infested areas to the south of Kansas. Cool and wet conditions periods over most of the western counties followed initial reports and were conducive to a build up of rust. By mid May, we saw severities reach 70 to 90 per cent of the flag leaf. Fields appeared yellow from roadsides. In west central Kansas where over 1/3 of the acreage was planted to susceptible cultivars, severities reached their zenith early on when plants were at heading. The west central crop reporting district was hit hard by this disease with an estimated 15.8% per cent loss overall and over a 28% loss on susceptible cultivars. South central and southwest crop reporting districts were also hit hard and lost 8.5 and 10.5 % of the crop respectively to yellow rust. Central, northwest, and north central Kansas loss estimates were in the 5-6 % range and the eastern third of the state experienced a > 3% overall loss. Major epidemics of stripe rust in Kansas have been occurring every other year since 2001 when loss was estimated at 7.3% and in 2003 with an estimate of 10.6%. The twenty year average is 1.4%.

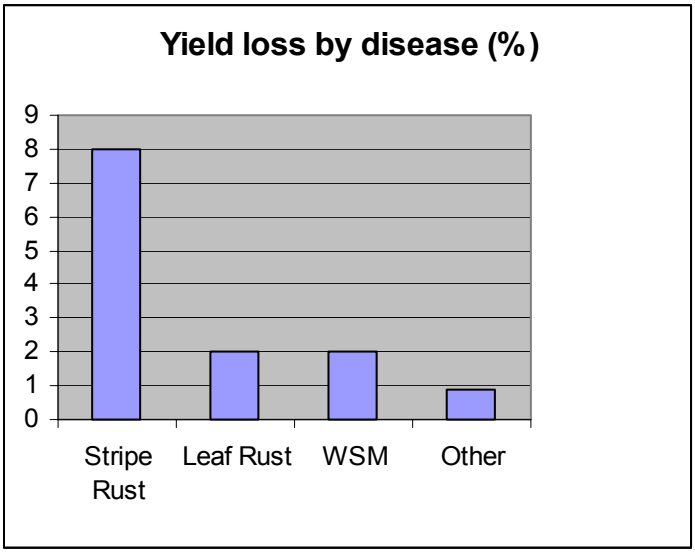


Figure 2. Three most important diseases in 2005

Leaf rust and wheat streak mosaic (WSM) were two diseases which affected primarily two separate areas of the state. Both diseases were responsible for an estimated 2% loss. Wheat streak mosaic was reported in many fields in southwest and west central Kansas. Greeley County (WC) was especially hit hard with well over ½ of the surveyed fields infected with an incidence greater than 10% and many with 30-80% incidence. Areas of southwest Kansas also had substantial infection. Central districts also had reports but these were more isolated than some of the large acreages infected in the western regions. Leaf rust was primarily a problem in the central districts where the disease came on late in May but reached high severities at some locations. Leaf rust loss estimation was based on the fact that almost all the varieties grown in Kansas were characterized as intermediate in resistance versus some true resistance as in past years. This was troubling as leaf rust seems to have adapted to Kansas varieties and likely will spell future problems to Kansas growers. The loss estimates compare to a 20 year average of 3.7% for leaf rust and a 1.8% average for wheat streak mosaic.

The image to the right is of a field in Kingman County with nearly 100% infection by WSM. The greener wheat in the background was planted later in the same field.

Figure 3. WSM in Kingman County.

Tan spot was rated fourth in importance in 2005 with an estimate of 0.6 %. Like leaf rust, tan spot was a problem to central Kansas growers. A 1% loss for the three central reporting districts and some reports in northeast Kansas were responsible for this estimate. Tan spot reached the flag leaf late in the year in situations with high crop residue. The loss was lower than the 1.1 % 20 year average.

Diseases of honorable mention were powdery mildew, ergot, and the *Septoria* complex. A 0.1% estimate was made for powdery mildew and *Septoria*. Powdery mildew was spotty and sometimes heavy in a few fields located throughout the state. It was not as widespread or common to fields as in 2004 when it was attributed to 0.8% loss. *Septoria* was again widespread in the early spring but did not progress except in a few situations. North central Kansas had perhaps some of the highest severities of the state with 10-20% severities. Ergot received honorable mention because of a localized outbreak in northeast Kansas which caused some rejection of grain at the local grain cooperatives. Freeze damage likely attributed to the ergot problem in that area by causing male sterility. Statewide loss was only trace to this disease.

Diseases which had some reports were barley yellow dwarf, soil borne mosaic and spindle streak viral complex and take all. Barley yellow dwarf has not been much of a concern since 2002. This year the aphid vectored virus was again at an extremely low incidence with a loss estimate of 0.01%. Soil borne was noted in northwestern and west central Kansas this past season along with other parts of the state. It was noted both in the KSU clinic and in field surveys that some symptoms mimicked nitrogen deficiency symptoms but tested positive in testing. Overall, 2005 Kansas saw soil borne reports on the increase and attributed to a wet fall particularly in some of the western counties. Take all was reported in some of north central counties in early June.

DISEASE	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	AVE
LEAF RUST	1	1	1.5	1.5	0	1.5	2.8	2.5	1.5	5	9	4	2.5	0.8	4	7.5	11.3	11	1	5	0.1	3.7	2.5	3.4	2.9	0.4	1	1.3	1.4	2	3.74
WHEAT STREAK MOSAIC VIRUS	0.3	1	3.5	0.5	0.3	7	0.4	1.2	0.1	0	3	2	13	3.5	1	4.5	0.3	0.5	0.9	0.6	0	0.6	0.3	1.5	0.9	0.001	1.3	0.4	0.4	2	1.84
SEPTORIA COMPLEX	2	0.5	1	0.5	1	0.5	2.5	5.8	3.5	2.8	1	1.5	0.5	0	0	2	1	3	0.6	7.4	1.5	0.1	0.6	0.4	0.04	0.1	0.2	0.1	0.05	0.1	1.01
SOILBORNE & SPINDLE STREAK	5	5	3.5	1.6	3	2	1.7	1.2	2.5	2.4	1.4	1	1.5	1	1.5	1	0.1	0.1	0	0.5	0	1	0.1	0.4	0	0.05	0.001	0.01	0.001	0.05	0.49
TAN SPOT		3	1	1.5	3.5	0.7	1.3	1.8	2.5	2.5	1	3.5	1	0.8	0.2	0.2	1.5	2.5	1.4	2	0	0.2	2.1	1.4	0.2	1.9	0.5	0.8	0.3	0.6	1.11
BARLEY YELLOW DWARF VIRUS	4.5	0.5	0.8	0	0	0	0	0.3	0	0	0	3.5	1.7	0.4	1.5	0.2	4.5	0.2	2	3.3	0.1	0.2	0.2	2.3	5	0.001	1.4	0.001	0.2	0.01	1.34
TAKE-ALL	3	1	2	0.5	0.6	0.7	0.4	1.1	1.2	2	1	0.4	1.3	0.4	0.6	1.3	0.1	0.6	0.1	0.2	0	0.01	0.01	0.01	0	0.001	0.01	0.001	0.2	0.001	0.31
CEPHALOSPORIUM STRIPE	3	1	0.9	1.5	1.3	0	1.5	1	0.4	0.4	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.001	0	0.001	0	0	0	0.001	0.01
ROOT & CROWN ROT			1.8	2			0.5	0.1	1	0.2	0.2	0.4	0.2	1	0.1	0.1	0.3	0.1	0.1	0.1	0.2	0.01	0.01	0.001	0	0.1	0.1	0.01	0.01	0.01	0.15
POWDERY MILDEW	0.4	0.2	0.5	1	0.1	1.3	0.6	0.8	0.5	0.2	0.3	0.3	0.4	0.3	1.3	0.5	0.2	0.1	0	0.1	0	0.01	0.05	0.001	0.05	0.001	0.01	0.1	0.8	0.1	0.23
SCAB			0		0		2.1	0.2	0.2	0	0.2	0.2	0	0.1	0.8	0.2	0	1.3	0	1.2	0.1	0	0	0.2	0	0.001	0.01	0.05	0.01	0.001	0.22
STEM RUST	0.1	0	0	0	0	0	0	0.1	0.1	0.1	4.6	0.1	0	0	0.1	0.7	0	0.1	0	0	0.1	0	0	0.001	0	0.001	1E-04	1E-04	0.001	0	0.29
STRAWBREAKER									0.8	1	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.001	0.3	0.001	1E-04	0	0	0	0.02
BACTERIAL LEAF BLIGHT								0.1	0.3	0		0	0.3	0	0	0	0	0	0	0.01	0	0	0	0	0	0.001	0	0	0.001	0.001	0.02
BUNT & LOOSE SMUT	0.4	0.2	0	0	0.2	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0	0	0	0.01	0	0.01	0.001	0.01	0.05	0.01	0.01	0.02	0.01	0.01
STRIPE RUST	0	0	0	0	0	0	0	0.1	0	0		0	0	0	0	0	0	0	0	0.01	0	0	0	0.001	0.05	7.3	0.01	10.6	0.01	8	1.37
AMERICAN WHEAT STRIATE																		0	0	0	0	0	0	0.001	0	0.001	1E-04	1E-04	0	0	0.00
SNOW MOLD																		0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
TOTAL	19.7	13.4	16.5	10.6	10.0	13.7	13.8	16.4	14.7	16.6	21.9	16.9	22.4	8.3	11.1	18.2	19.3	19.5	6.1	20.4	2.1	5.8	5.9	9.6	9.5	9.9	4.6	13.4	3.4	12.9	12.06

Estimates prepared by Kansas State University, Kansas Department of Agriculture and USDA-ARS personnel. Estimates are based on expert opinions, but are not statistically designed.
Estimates utilize a disease survey, cultivar resistance, cultivar acreages, crop district yield estimates, and loss functions or estimates for each disease.
Trace amounts were entered as 0.001. Blanks indicate no loss estimate made.
WSMV includes other curl mite vectored viruses e.g. High Plains Mosaic Virus